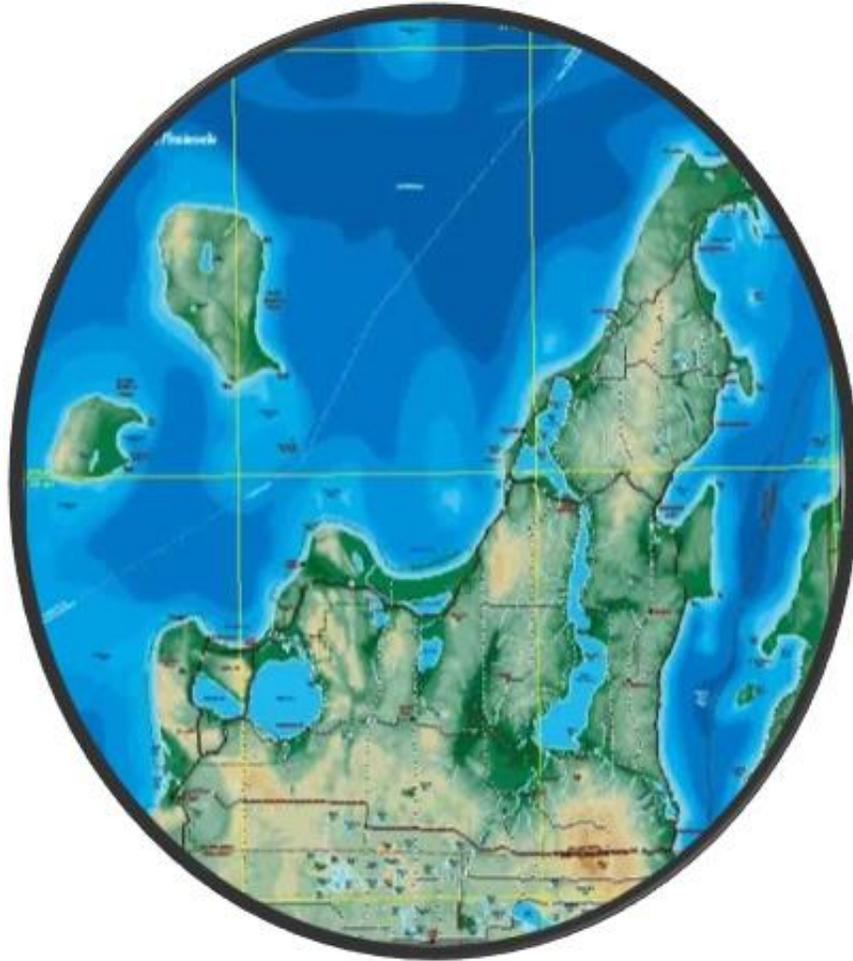


LEELANAU COUNTY



WATER QUALITY MONITORING 2014-2015

Compliments of Leelanau Clean Water (To be updated every two years)

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PURPOSE



Access Data for Leelanau County Water Quality Testing of Lakes and Streams



Compare Data for Leelanau County Lake and Stream Testing



Set Up a Water Monitoring Program for your Lake/Stream or Watershed



Set Up a Specific Test for Your Lake/Stream or Watershed



Choose a Lab to Analyze Your Water Samples



Identify a Collection of Macroinvertebrates



Consult with Someone about Their Monitoring Program



Receive Mentoring Help with Monitoring



BENZIE-LEELANAU DISTRICT HEALTH DEPARTMENT WATER QUALITY MONITORING

CONTACT • Tom Fountain (231-882-2105)

LAB(S) USED • SOS Analytical

DATA BASE • <http://www.deq.state.mi.us/beach/> (E. Coli)

Data Collected	Frequency Sampled	Location Sampled	Data Base/Protocol
Nitrates	New Wells	Drinking water	Nitrate results kept on spreadsheet at the Board of Health
E. coli			
Nitrite	Requested/ arranged privately by homeowner		
Chloride			
Fluoride			
Hardness			
Iron			
Sulfate			
Sodium			
E.coli	Collection done by The Watershed Center, Results reported to the Board of Health	Beaches: Empire, Northport, Suttons Bay Park and Marina, Greilickville, Elders, South Barr, Neddows (Lee)	http://www.deq.state.mi.us/beach/



CEDAR LAKE ASSOCIATION

WATER QUALITY MONITORING PROGRAM

CONTACT ● Lori Leugers (231-499-4911)

LAB(S) USED ● Michigan State through MiCorps
● Hydrolab

DATA BASE ● MiCorps CLMP Documents-MiCorps→Data Exchange→View Data→Skip→Lake or Stream

● Leelanau Conservancy Website leelanauconservancy.org→The Leelanau Conservancy→Land Protection→Water Quality Data Base→Browse Lake (or Stream Reports)

PROTOCOL ●Clean Lake Monitoring Program through MiCorps, Hydrolab Manual

Data Collected	Frequency	Location Sampled	Data Base/Protocol
Secchi Disc (Transparency)	Every week May-September	Deep basin of Cedar Lake	Coordinated through MiCorps, CLMP
Total Phosphorus	Spring Overturn Late Summer	Deep basin of Cedar Lake	Coordinated through MiCorps, CLMP Samples analyzed at MSU Labs
Exotic Plant Survey	Once a year	Transect around the lake	Not reported
Hydrolab (Temperature, DO, pH, specific conductance, ORP)	3-6x/year May-September	Deep Basin	Leelanau Conservancy Website Hydrolab Manual
Chlorophyll a	3-6x April-October	Deep basin	Standard Methods (SM) 102200H 50 ml from 1 m depth, filtered in the field (.95 microns) Frozen, analysis by GLEC)
Plankton studies	3-6x April-October 2000-2013	Tow	Analysis by Dr. Rex Lowe Bowling Green State University 870 ml whole water sample preserved with formalin
Secchi Disc	3-6x April-October	Deep basin	Lower secchi on shaded side of boat until not visible, note depth, raise secchi disc until visible, note depth and record mid-point
Nitrate/Nitrite-Nitrogen	3x a season, May-September		SM 4500-N03H Analysis by GLEC
Total Phosphorus	3x a season, May-September		SM 4500-PF Analysis by GLEC



GLEN LAKE ASSOCIATION WATER QUALITY MONITORING PROGRAM

- CONTACT**
- Rob Karner, Glen Lake-Crystal River Watershed Biologist (883-2776)
 - Denny Becker, Water Quality Committee Chair (231-334-7363)
- LAB(S) USED**
- SOS Analytical jack@sosanalytical.com
 - Michigan State through MiCorps
 - Trace Analytical Lab
 - Hydrolab
- DATA BASE**
- Glen Lake Association Web Site glenlakeassociation.com → master database for Hydrolab historical data-all years, all sites 3.14.14 or master data base for plankton, cladophora, inlet study

Data Collected	Frequency Sampled	Location Sampled	Data Base/Protocol
Transparency (Secchi Disk)	1x/week May through September	Deep basins of Big Glen, Little Glen, Brooks Lake	Since 1979 Measurements by GLA Volunteers Coordinated through MiCorps, CLMP
Chlorophyll a	5x/year sampled Mid May through Mid September	Deep basins of Big Glen, Little Glen, Little Fisher, Big Fisher, Brooks Lake	Since 2001 on Big and Little Glen, since 2006 on all Coordinated through MiCorps, CLMP Samples analyzed at MSU Labs
Total Phosphorus	Spring overturn and late summer after stable stratification	Deep basins of Big Glen, Little Glen, Little Fisher, Big Fisher, Brooks Lake	Since 2001 on Big and Little Glen, since 2006 on all Coordinated through MiCorps, CLMP Samples analyzed at MSU Labs
Hydrolab (Temperature, DO, pH, specific conductance, ORP)	Every two weeks from April to November; year-round sampling on Hatlem, Crystal River and Brooks Lake	Deep basins of Big Glen, Little Glen, Little Fisher, Big Fisher; Brooks Lake at the bridge; headwaters middle reaches and mouth of Crystal River	Hydrolab/Datasonde equipment provided by Glen Lake Association and tests taken by Glen Lake Association Biologist
Plankton studies	1x/month May through September	Big and Little Glen, Big and Little Fisher	Collections taken and analysis done by Glen Lake Association Biologist
Naturalization of Shorelines	Each Summer	Big and Little Glen	Lake Biologist Home visits to high cladophora properties
Shoreline Greenbelt Surveys	Every 5 years	Big and Little Glen	Performed by GLA volunteers and supervised by GLA Biologist
Cladophora shoreline Survey	Late July or early August	Big and Little Glen	Performed by paid interns and supervised by GLA Biologist
Aquatic Plant Survey	Every 5 years	Big Glen, Little Glen, Little Fisher, Big Fisher, Brooks Lake	Coordinated through MiCorps, CLMP All plants identified, located via GPS, collections estimate total biomass
Invasive Aquatic Plant Survey	1x/year	Big Glen, Little Glen, Little Fisher, Big Fisher, Brooks Lake	Eurasian water milfoil, hydrilla, and curly leaf pondweed, stary stonewort presence survey Coordinated through MiCorps, CLMP All plants identified, located via GPS, collections estimate total biomass
Sediment Analysis Michigan 10 Metals	When analysis needed	Deep basins of Big Glen, Little Glen, Little Fisher, Big Fisher, Brooks Lake	Trace Analytical lab analysis from Petite Eckman collections by GLA Biologist (10 metals include: Arsenic, Lead, Selenium, Barium, Cadmium, Chromium, Silver, Zinc, Copper, Mercury)

Conductivity (microseimens)	Once a Year-Mid June	Seeps along shoreline-15 locations on Big Glen	Rob Karner, Watershed Biologist Using Hydrolab
Snow Melt Studies-pH, Conductivity	Once a Year-March	M-22 Bridge and Co Rd 675	Rob Karner, Watershed Biologist Using Hydrolab
Hydraulic Fracturing Signature Chemical/Parameter Baseline	Once a year for 2 years	Collection of samples from 10 homes, Crystal River, and Hatlem Creek by SOS Analytical	Using the protocol of the Community Science Institute, Ithaca, New York and EPA protocol Baseline prior to contamination of ground water and/or the decrease in ground water



**GRAND TRAVERSE BAND OF OTTAWA/CHIPPEWA NATURAL RESOURCES DEPARTMENT
SURFACE WATER ANALYSIS PROGRAM**

CONTACT • Sam Thurlow McClellan (231-534-7976)

LAB(S) USED • Great Lakes Environmental Center (GLEC) and Tetra Tech

DATA BASE • Grand Traverse Band of Ottawa/Chippewa Indians→Natural Resources→Environmental Program→CWA Sections 106 and 319→Nonpoint Source Assessment Report 2013→pp. 2-5 and 73-74

PROTOCOL • Tetra Tech, Inc. Cleveland, Ohio EPA Standards

Data Collected	Frequency Sampled	Location Sampled	Data Base/Protocol
Chlorophyll a	Page 15 of the Nonpoint Source Assessment Report 2013 (follow data base path above)	Belanger Creek, Ennis Creek, Mebert Creek, Victoria Creek, Crystal River, Leland River, Shalda Creek, Lee Creek, Northport, Omena Bay	Data base above
Soluble Reactive Phosphorus			
Total Phosphorus			
Nitrates			
Nitrites			
Sediments (TP)			
Macroinvertebrates			
Conductivity			
E. coli			
Temperature			
Turbidity			



INLAND SEAS EDUCATION ASSOCIATION WATER QUALITY MONITORING PROGRAM

CONTACT ● Fred Sitkins, Executive Director or Emily Shaw, Education and Volunteer Coordinator (231-271-3077)

LAB(S) USED ● NA all testing/analysis done on board the ship

DATA BASE ● isea@schoolship.org→ISEA Schoolship Data→scroll down→year of interest for fish species and quantity

PROTOCOL ● ISEA Instructors Manual

Data Collected	Frequency Sampled	Location Sampled	Data Base/Protocol
Surface water temperature	Daily during sailing season	Lake Michigan	ISEA Instructor's Manual
Bottom water temperature			
Secchi disk depth			
Bottom water pH			
Bottom water dissolved oxygen			
Benthos organisms			
Zooplankton- relative abundance			
Fish			Data Base path above



LAKE LEELANAU LAKE ASSOCIATION WATER QUALITY MONITORING PROGRAM

CONTACT • Wayne Swallow, Lake Leelanau Association Lake Biologist (231-941-4698)

LAB(S) USED • Hydrolab and MiCorps, CLMP Samples analyzed at MSU Labs

DATA BASE • Leelanau Conservancy Website leelanauconservancy.org→The Leelanau Conservancy→Land Protection→Water Quality Data Base→Browse Lake (or Stream Reports

• CLMP Documents-MiCorps→Data Exchange→View Data→Skip→Lake or Stream

Data Collected	Frequency Sampled	Location Sampled	Data Base/Protocol
Invasive Plant Survey	Annual inspection at boat ramps during fall of year 2006-2009. Conducted first documented survey summer 2010 Partial Survey 2013	North and South Lake Leelanau Stream Mouth of Victoria Creek, Perrins Landing, and Solon Twp Park	Not reported MiCorps CLMP
Hydrolab (Temperature, DO, pH, specific conductance, ORP) Phosphorus only 2014	3-6 x a season, April-October	8 streams North Lake Leelanau (2 sites), South Lake Leelanau (3 sites)	The current sites can be viewed on the conservancy website. Streams normally sampled 4x-6x/yr for NO3/NO2, TKN, NH3-N,TP, Flow, & Temp 1992-1996,1999, 2000, & 2001. Sampled 4x/year 2006-2009, but reduced to 8 streams per year on rotating basis, because lack of funding. Data Base: Leelanau Conservancy Funded by Leelanau Clean Water/Leelanau Conservancy
Dissolved Oxygen/Temperature	2010-2013 Bi-weekly	Deepest point in North and South Lake Leelanau	YSI-Pro instrumentation MiCorps CLMP Data Base
Chlorophyll a	Once a month May-September	Deep Basin of North and South Lake Leelanau	MiCorps, CLMP Samples analyzed at MSU Labs

Total Phosphorus	Spring overturn and late summer overturn	Deep Basin of North and South Lake Leelanau	MiCorps, CLMP Samples analyzed at MSU Labs
Secchi Disk (transparency)	Once a week May-September	Deep Basin of North and South Lake Leelanau	MiCorps, CLMP Samples analyzed at MSU Labs



LEELANAU CONSERVANCY

WATER QUALITY MONITORING PROGRAM

- CONTACT** • Yarrow Wolfe (231-256-9665)
LAB(S) USED • Great Lakes Environmental Center (GLEC)
DATA BASE • Leelanau Conservancy Website leelanauconservancy.org→The Leelanau Conservancy→Land Protection→Water Quality Data Base→Browse Lake (or Stream) Reports
 • Various Historical Data from 1992 also available

Data Collected	Frequency Sampled 1990-Current	Location Sampled	Data Base/Protocol
Hydrolab (Temperature, DO, pH, specific conductance, ORP) <i>(Included in Lake Leelanau Lake Association, Little Traverse, Lime Lake, Cedar Lake section as well)</i>	3-6x April-October	Lakes: Big Glen, Little Glen, Little Traverse, Lime Lake, Cedar Lake, North Lake Leelanau (1 site), South Lake Leelanau (1 site) Steams sampled on a 2 year rotation basis	Stream locations and sites have changed over the years. The current sites can be viewed on the conservancy website. Streams normally sampled 4x-6x/yr for NO3/NO2, TKN, NH3-N, TP, Flow, & Temp 1992-1996, 1999, 2000, & 2001. Sampled 4x/year 2006-2009, but reduced to 8 streams per year on rotating basis, because lack of funding. Data Base Path Above Hydrolab Sampling/Manual
Chlorophyll a	3-6x April-October	Lakes: Big Glen, Little Glen, Little Traverse, Lime Lake, Cedar Lake, North Lake Leelanau (2 sites), South Lake Leelanau (3 sites)	Standard Methods (SM) 102200H 50 ml from 1 m depth, filtered in the field (.95 microns) Frozen, analysis by GLEC)
Plankton studies	3-6x April-October 2000-2013	Lakes: Big Glen, Little Glen, Little Traverse, Lime Lake, Cedar Lake, North Lake Leelanau (2 sites), South Lake Leelanau (3 sites)	Analysis by Dr. Rex Lowe Bowling Green State University 870 ml whole water sample preserved with formalin
Secchi Disc	3-6x April-October	Lakes: Big Glen, Little Glen, Little Traverse, Lime Lake, Cedar Lake, North Lake Leelanau (2 sites), South Lake Leelanau (3 sites)	Lower secchi on shaded side of boat until not visible, note depth, raise secchi disc until visible, note depth and record mid-point
Nitrate/Nitrite-Nitrogen	3x a season, May-September	19 streams(currently) AND Lakes: Big Glen, Little Glen, Little Traverse, Lime Lake, Cedar Lake, North Lake Leelanau (2 sites), South Lake Leelanau (3 sites)	SM 4500-N03H Analysis by GLEC
Total Phosphorus	3x a season, May-September	19 streams(currently) AND Lakes: Big Glen, Little Glen, Little Traverse, Lime Lake, Cedar Lake, North Lake Leelanau (2 sites), South Lake Leelanau (3 sites)	SM 4500-PF Analysis by GLEC



LEELANAU CONSERVANCY WATER QUALITY MONITORING PROGRAM

CONTACT • Yarrow Wolfe (231-256-9665)

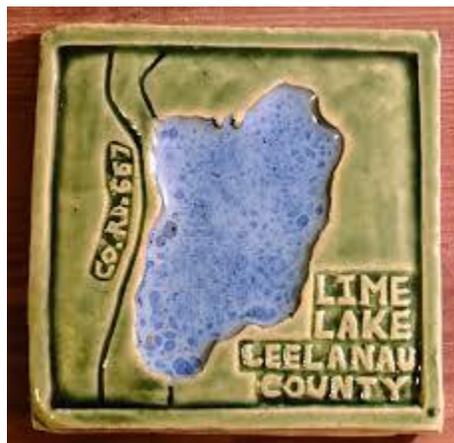
LAB(S) USED • Great Lakes Environmental

DATA BASE • Leelanau Conservancy Website leelanauconservancy.com→The Leelanau Conservancy→Land Protection→Water Quality Data→Browse Lake (or Stream) Reports

Data Collected	Frequency Sampled	Location Sampled	Data Base/Protocol
Total Phosphorus only 2014 Previous years: Temperature, Flow, Ammonia, Nitrate, Total Kledahl, Nitrogen	2 year rotation basis	Beaudwin Creek	Stream Sampling Instructions written and housed at the Conservancy Total Phosphorus SM 4500-P F Ammonia SM 4500 NH3 D TKN SM 4500 Nor D Just Phosphorus 2014 (GLEC)
		Belanger Creek	
		Belnap Creek	
		Cedar Creek	
		Ennis Creek	
		Hatlem Creek	
		Hines Creek	
		Houdak Creek	
		Leo Creek	

		Lime Creek	
		Mebert Creek	
		Northport Creek	
		Provement Creek	
		Rice Creek	
		Shalda Creek	
		Victoria Creek	
		Weaver Creek	





LIME LAKE ASSOCIATION

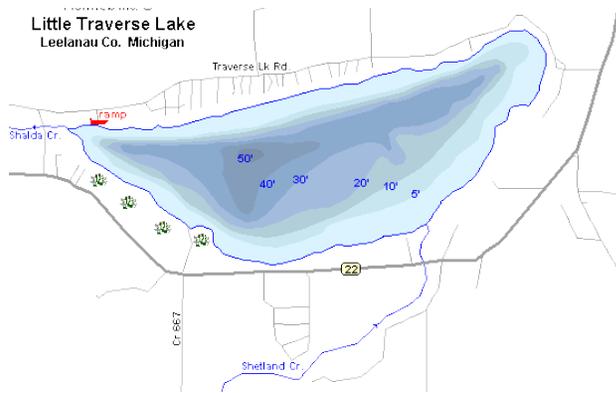
WATER QUALITY MONITORING PROGRAM

CONTACT • Dennis Ferguson (231-228-4039)

LAB(S) USED • Great Lakes Environmental

DATA BASE • Leelanau Conservancy Website leelanauconservancy.org → The Leelanau Conservancy → Land Protection → Water Quality Data Base → Browse Lake (or Stream) Reports
• Various Historical Data from 1992 also available

Data Collected	Frequency Sampled	Location Sampled	Data Base/Protocol
Hydrolab (Temperature, DO, pH, specific conductance, ORP)	3-6x/year April-October.	Deep basin	Done by the Leelanau Conservancy Hydrolab Manual Data Base Path Above
Baseline Shoreline Survey	Once for baseline	Shore and uplands	Done by NMC Graduate Student from the Fresh Water Studies
Chlorophyll a	3-6x April-October	Deep basin	Standard Methods (SM) 102200H 50 ml from 1 m depth, filtered in the field (.95 microns) Frozen, analysis by GLEC)
Plankton studies	3-6x April-October 2000-2013	Tow	Analysis by Dr. Rex Lowe Bowling Green State University 870 ml whole water sample preserved with formalin
Nitrate/Nitrite-Nitrogen	3x a season, May-September	Deep basin	SM 4500-N03H Analysis by GLEC
Total Phosphorus	3x a season, May-September		SM 4500-PF Analysis by GLEC
Secchi Disc	3-6x April-October		Lower secchi on shaded side of boat until not visible, note depth, raise secchi disc until visible, note depth and record mid-point



LITTLE TRAVERSE LAKE WATER QUALITY MONITORING PROGRAM

CONTACT • Len Allgaier (231-228-6763)

LAB(S) USED • Great Lakes Environmental

DATA BASE • Leelanau Conservancy Website leelanauconservancy.org→The Leelanau Conservancy→Land Protection→Water Quality Data Base→Browse Lake (or Stream Report)

Data Collected	Frequency Sampled	Location Sampled	Data Base/Protocol
Hydrolab (Temperature, DO, pH, specific conductance, ORP)	3-6x/year April-October	Deep basin	Done by the Leelanau Conservancy Data Base Path Above
Baseline Shoreline Survey	Once for baseline	Shoreline and uplands	Done by NMC Graduate Student at the Fresh Water Institute
Chlorophyll a	3-6x April-October	Deep basin	Standard Methods (SM) 102200H 50 ml from 1 m depth, filtered in the field (.95 microns) Frozen, analysis by GLEC)
Plankton studies	3-6x April-October 2000-2013	Tow	Analysis by Dr. Rex Lowe Bowling Green State University 870 ml whole water sample preserved with formalin
Nitrate/Nitrite-Nitrogen	3x a season, May-September	Deep basin	SM 4500-N03H Analysis by GLEC
Total Phosphorus	3x a season, May-September		SM 4500-PF Analysis by GLEC
Secchi Disc	3-6x April-October		Lower secchi on shaded side of boat until not visible, note depth, raise secchi disc until visible, note depth and record mid-point

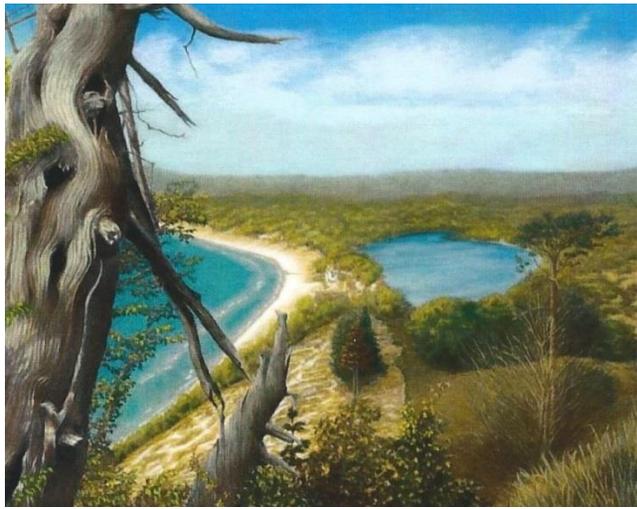


SLEEPING BEAR DUNES NATIONAL LAKESHORE WATER QUALITY MONITORING PROGRAM

- CONTACT** ● Chris Otto, Biologist (231-326-4753)
- LAB(S) USED** ● St. Croix Watershed Research Station, Marine on St. Croix, MN
 ●CT Laboratories, LLC, Baraboo, WI
- DATA BASE** ● EPA STORET Data Warehouse Access→Browse (yellow box) →Michigan, Leelanau→Select Option 4→11NPSWRD→SLBELKWQ→Scroll down to Result Download at bottom of page→Enter email→3 characters LCW Follow directions to convert to access data base.
- Historical Data Google→ Sleeping Bear National Lakeshore Water Resource Management Plan 2002→Table 2, 3 and 4 Water Quality Monitoring

Data Collected	Frequency Sampled	Location Sampled	Data Base/Protocol
Temperature, pH, Specific Conductance, Dissolved Oxygen, Water level/flow, Water clarity	3x/year	Manitou, Florence, Shell, Bass (Leelanau), Loon, and North Bar Lakes From 2008-2011 Otter, Tucker, Round Lake Narada Lake was sampled 1x/year from 2008-2011	Collected in-situ in one meter increments using a multiprobe Elias, J. E, R. Axler, and E. Ruzycski. 2008. Water quality monitoring protocol for inland lakes. Version 1.0. National Park Service, Great Lakes Inventory and Monitoring Network. Natural Resources Technical Report NPS/MWR/GLKN/NRTR—2008/109. National Park Service, Fort Collins, Colorado. STORET Data Warehouse
Alkalinity, Chloride, Sulfate, Dissolved Organic Carbon, Silica	1x/year	Manitou, Florence, Shell, Bass (Leelanau), Loon, and North Bar Lakes From 2008-2011 Otter, Tucker, Round Lake Narada Lake was sampled 1x/year from 2008-2011	Elias, J. E, R. Axler, and E. Ruzycski. 2008. Water quality monitoring protocol for inland lakes. Version 1.0. National Park Service, Great Lakes Inventory and Monitoring Network. Natural Resources Technical Report NPS/MWR/GLKN/NRTR—2008/109. National Park Service, Fort Collins, Colorado. STORET Data Warehouse

Total Phosphorus, Total Nitrogen, Ammonium-Nitrogen, Nitrate/Nitrite-Nitrogen, Chlorophyll-a	3x/year	Manitou, Florence, Shell, Bass (Leelanau), Loon, North Bar Lakes From 2008-2011 Otter, Tucker, Round Lake Narada Lake was sampled 1x/year from 2008-2011	Elias, J. E, R. Axler, and E. Ruzycki. 2008. Water quality monitoring protocol for inland lakes. Version 1.0. National Park Service, Great Lakes Inventory and Monitoring Network. Natural Resources Technical Report NPS/MWR/GLKN/NRTR—2008/109. National Park Service, Fort Collins, Colorado. STORET Data Warehouse
Near-bottom Total Phosphorus	1x/year (in stratified lakes only)	Manitou, Florence, Shell, Bass (Leelanau), Loon, and North Bar Lakes From 2008-2011 Otter, Tucker, Round, and Narada Lake sampled 1x/year	Elias, J. E, R. Axler, and E. Ruzycki. 2008. Water quality monitoring protocol for inland lakes. Version 1.0. National Park Service, Great Lakes Inventory and Monitoring Network. Natural Resources Technical Report NPS/MWR/GLKN/NRTR—2008/109. National Park Service, Fort Collins, Colorado. STORET Data Warehouse
Cations (Ca, Na, Mg, K) <i>Discontinued in 2013</i>	1x/year (2008-2012)	Manitou, Florence, Shell, Bass (Leelanau), Loon, and North Bar Lakes	Elias, J. E, R. Axler, and E. Ruzycki. 2008. Water quality monitoring protocol for inland lakes. Version 1.0. National Park Service, Great Lakes Inventory and Monitoring Network. Natural Resources Technical Report NPS/MWR/GLKN/NRTR—2008/109. National Park Service, Fort Collins, Colorado. STORET Data Warehouse
E. coli	1x/week		QCPR: DNA Testing (Pilot Year) DEQ→Beach Guard



SOUTH BAR LAKE

WATER QUALITY MONITORING PROGRAM

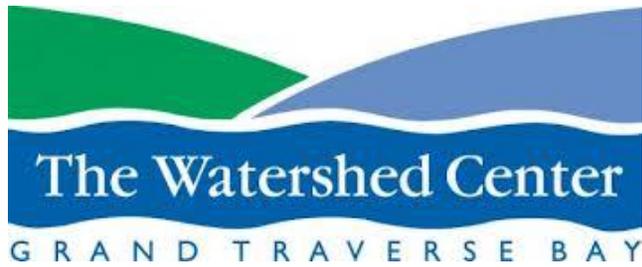
CONTACT • Carol Peterson (331-326-5661)

LAB(S) USED • Michigan State through MiCorps

DATA BASE • MiCorps CLMP Documents-MiCorps→Data Exchange→View Data→Skip→Lake or Stream

PROTOCOL • Clean Lake Monitoring Program through MiCorps

Data Collected	Frequency Sampled	Location Sampled	Data Base/Protocol
Secchi Disk (Transparency)	Weekly May-September	Deep basin of South Bar	Coordinated through MiCorps, CLMP Samples analyzed at MSU Labs Data Base Path Above
Total Phosphorus	Spring Overturn Late Summer	Deep basin of South Bar	Coordinated through MiCorps, CLMP Samples analyzed at MSU Labs Data Base Path Above
Chlorophyl a	5x/year sampled Mid May through Mid September	Deep basin of South Bar	Coordinated through MiCorps, CLMP Samples analyzed at MSU Labs Data Base Path Above
Aquatic Plant Survey	Every five years	South Bar at depths out to 15 feet	Coordinated through MiCorps, CLMP All plants identified, located via GPS, collections estimate total biomass Data Base Path Above



WATERSHED CENTER GRAND TRAVERSE BAY

WATER QUALITY MONITORING PROGRAM

CONTACT ● Sarah U'Ren, Program Director (231-935-1514 ext.2)

LAB(S) USED ● SOS Analytical

DATA BASE ● <http://data.gtbay.org/wqdb.asp> (Historical)

● <http://www.deq.state.mi.us/beach/> (E. Coli)

Data Collected	Frequency Sampled	Location Sampled	Data Base/Protocol/Funding
E. Coli (Great Lakes)	Once/week during swim season (late May - early September)	Empire, Northport, Suttons Bay Marina, Greilickville, Elders Beach, Suttons Bay Park	http://www.deq.state.mi.us/beach/ QAPP Monitoring Plan Available on Request
E. Coli (inland lakes)	Once/week during swim season (late May - early September)	South Bar Lake (Empire), Neddows Beach (Lake Lee.)	http://www.deq.state.mi.us/beach/ QAPP Monitoring Plan Available on Request
Sediment: Ammonia, Kjeldahl-N, Total P Water: TP, Ortho-P, Ammonia, Kjeldahl-N, Nitrate, Nitrite, Temp, pH, DO	Once - Fall 2009	Cedar Creek (outlet to Bay)	MDEQ Local Monitoring/National Fish and Wildlife Foundation QAPP Monitoring Plan Available on Request
Sediment: Ammonia, Kjeldahl-N, Total P Water: TP, Ortho-P, Ammonia, Kjeldahl-N, Nitrate, Nitrite, Temp, pH, DO	Once Fall 2009	Leo Creek (outlet to Bay)	MDEQ Local Monitoring/National Fish and Wildlife Foundation QAPP Monitoring Plan Available on Request
Macroinvertebrates	Twice/year (June, October) (varying years)	Creeks: Cedar/Hines, Bingham, Northport, Weaver, Brewery, Lee, Waterwheel Park (Suttons Bay), Leo	TWC's Adopt a Stream program (self funded) QAPP Monitoring Plan Available on Request
Storm drains BOD (5-day), chloride, E.Coli, Ammonia, Nitrate/Nitrite, Oil&Grease, pH, Total P, TSS, Surfactants	Once Summer 2012	Outlets to Grove, Madison, Broadway Street Drains	EPA-GLRI QAPP Monitoring Plan Available on Request